MEMORY EXPANSION COMPARISONS   I've been asked about the memory expansion schemes - the Blue Ram, the VIPER, and the future Add-Under. I really can't answer "Which is best?" because it depends on what you want to do, how involved you want to get, how much you can afford to spend, such type factors. A 'problem' with the systems is that they are not directly comparable. It is difficult to set up a grading system because each has virtues beyond such factors as 'dollars per K of memory' or some other attempt at rationalization. You have to look at what other features are involved with each unit, and what is important to you. In a way it is a more comfortable situation than we had over a year ago when there was very little to look forward to.

MORE FOR YOUR MONEY   With this issue, we surpass last year's total output (106 pages), and by the time we finish the year out, the pages per dollar will also better last year's - even accounting for the postage increase. So at least from a volume standpoint, you are beating inflation. Who else can state that fact?

VIPER SYSTEM   You'll find their ad on page 109, this time with two photos of their first product output. The last of the parts has arrived, and they are ready to ship units, with the new Extended Basic language included.

ASTRO VISION BASIC   is on schedule, the last obstacle was the necessity to drill two holes in the case for the tape jack and the LED level indicator. The instruction Manual is in print, and the package should soon be out. The Manual includes a program which will allow the new Basic to load existing programs (at the 300 baud rate), so that they can be used and stored with the new 2000 baud rate. We have a copy here, and are translating selected ARCADIAN programs into the new format. These programs will be made available on tape to purchasers of the new Basic and the total Arcade Plus system, and the authors included will receive royalties based on program size.

SPEECH SYNTHESIS   for the new AddUnder will use the Votrax SC-01 Chip. This chip implements the 'formant synthesis' technique to model the human voice's resonances, making up each of the sounds one utters. These sounds are selectively added together by the computer to make up a word, using a 'phoneme generator'. Each of the 64 available phonemes has an 8-bit code, with two of those bits used for pitch control.

CONTEST THOUGHTS   We have four entries for the regular, ongoing prize of $100. this issue: Bally Black Box, Daredevil, New Sub Search, and Pits. The winner of this contest will replace Dave Ibach on the judging panel. With regard to the future, we will be entering an interim period where there will be first a few, then more and more of the AstroVision Basics in the field, and those owners will (hopefully) become ARCADIAN subscribers. Any AstroVision Basic programs submitted on the near future will not be considered because the subscriber population will be very small. I'll keep a tally, and sometime next year we'll have a date when those programs will be accepted.

```
   1 .NEW SUB SEARCH
   2 .BY RON PICARDI
   5 GOTO 100
  10 LINE X+12,Y+Rb2,0;LINE X-10,Y-Rb2,3;LINE X+11,Y-1+Rb2,0;LINE X-10,Y-1-Rb2,3

  11 LINE X+10,Y-2+Rb2,0;LINE X-8,Y-2-Rb2,3;LINE X,Y,0;LINE X-Rb2,Y+6,3
  12 LINE X+1,Y,0;LINE X+1-R,Y+3,3;RETURN
  20 BOX -30,-30,10,3,3;BOX -28,-28,2,3,3;RETURN
  30 FOR A=1TO 2;FOR B=-20TO 20STEP 3;Q=FC;FC=BC;MU="!";FC=Q;LINE X,Y,0;LINE X+B
,Y+20,3;NEXT B;NEXT A;RETURN
  40 FOR A=1TO 10;&(22)=255;FOR B=60TO 10STEP -1;&(18)=B;NEXT B;&(22)=0;FOR B=1T
O 30;NEXT B;NEXT A;RETURN
  50 X=0;Y=0;CLEAR ;BOX 0,-20,150,36,1;GOSUB 10;PRINT "SONAR CONTACT";GOSUB 20
  55 FOR A=1TO 10;&(18)=30;FOR B=255TO 0STEP -10;&(22)=B;NEXT B;FOR B=1TO 30;NEX
T B;NEXT A;RETURN
 100 CLEAR ;R=0;U=RND (10)b15-90;V=RND (10)b5-25;S=RND (10)b15-90;T=RND (10)b5-2
5
 105 C=1;FOR A=-75TO 60STEP 15;FOR B=-20TO 25STEP 5;BOX A,B,1,1,1;NEXT B;NEXT A
 106 CY=-30;PRINT "USE JOYSTICK TO SEARCH
 110 X=U;Y=V;GOSUB 10;GOSUB 10010;CY=40;PRINT "MOVE #",#2,C;C=C+1
 120 U=U+JX(1)b15;V=V+JY(1)b5;IF U-X+V-Y=0GOTO 120
 130 IF U>60U=60
 131 IF U<-75U=-75
 132 IF V>25V=25
 133 IF V<-20V=-20
 140 IF U=SIF V=TGOTO 200
 145 IF RND (100)=1GOTO 500
 150 GOSUB 10;GOTO 110
 200 GOSUB 50;U=RND (5);V=RND (5);Z=RND (3);S=3;W=3;H=0
 210 CLEAR ;PRINT "SUB WAS,";IF S>VPRINT "NORTH",
 211 IF S<VPRINT "SOUTH",
 212 IF S#VIF W#UPRINT " AND ",
 213 IF W>UPRINT "WEST
 214 IF W<UPRINT "EAST
 215 IF H>ZPRINT "TOO LOW
 216 IF H<ZPRINT "TOO HIGH
 217 IF H=ZPRINT "DEPTH OK
 220 CX=0;CY=24;NT=0;PRINT "  1 2 3 4 5";CX=0;PRINT "1 * * * * *";CX=0;PRINT "2
* * * * *"
 221 CX=0;PRINT "3 * * * * *";CX=0;PRINT "4 * * * * *";CX=0;PRINT "5 * * * *
 230 BOX -1+Wb12,24-Sb8,7,7,3
 240 CY=0;PRINT "DEPTH",#2,H;NT=3
 250 PRINT "ENTER DATA";INPUT "N - ",S;INPUT "E - ",W;INPUT "DEPT",H
 260 CLEAR ;BOX 0,-20,150,36,1;Y=0;FOR X=0TO 36STEP 3;GOSUB 10;BOX 0,-X,1,1,3;FO
R A=1TO 30;NEXT A;BOX 0,-X,1,1,3;GOSUB 10;NEXT X
 270 GOSUB 10;X=0;Y=-36;GOSUB 30;IF V=SIF U=WIF H=ZGOTO 400
 280 IF RND (5)=1GOTO 501
 290 CLEAR ;GOTO 210
 400 PRINT "BOOM";GOSUB 20;X=-30;Y=-30;GOSUB 30;GOSUB 20;G=G+1
 410 IF RND (10)=1PRINT "YOU STARTED WW3";GOSUB 40;PRINT "SELF DESTRUCT IS SET";
GOSUB 40;&(8)=3
 420 GOTO 1000
 500 GOSUB 50
 501 PRINT "TORPEDO ATTACK";GOSUB 30;GOSUB 10;Y=-2;GOSUB 10;PRINT "ABANDON SHIP"
;GOSUB 40
```

Ron Picardi
630   Bacon
Saginaw, MI   48603

```
510 GOSUB 10;FOR R=0TO 2;GOSUB 10;FOR A=1TO 30;NEXT A;GOSUB 10;NEXT R
520 FOR Y=-2TO -30STEP -2;GOSUB 10;FOR A=1TO 30;NEXT A;GOSUB 10;NEXT Y
530 I=I+1
1000 CLEAR ;PRINT "SUBS SUNK",#2,G,#2;PRINT "SHIPS LOST",#2,I;PRINT "PLAY AGAIN?
     1-YES 2-NO"
1010 IF &(23)=8GOTO 100
1020 IF &(22)=8GOTO 1040
1030 GOTO 1010
1040 PRINT "OK I HOPE THAT YOU ENJOYED YOURSELF";STOP
10000 FOR A=1TO 2000;NEXT A;RETURN
10010 FOR A=1TO 200;NEXT A;RETURN
```

New Sub Search

This revision of the Sub Search printed in an earlier issue of Arcadian has several new and better features. The search mode on the 10 by 10 sea map is done with the joystick, you can move your ship in any of eight directions. A move counter is displayed as well as the ship's location. The game will wait for you to use the joystick to move. You continue searching until you find the sub or it finds you.

If the sub shoots you, your ship sinks by the stern.

When you find the sub, a 5 by 5 sonar map is displayed along with information on about where the sub is to the inverse marker. You then enter target information. The screen is not cluttered with the variable used. Your depth charge is dropped and you hit or miss.

Oh, by the way, it is possible to cause world war 3, the program will self destruct, so be sure it is on tape. If you don't want to reload each time it happens, delete &(8)=3 from line 410. Your score is displayed at the end of each game. Have fun. Programmed by Ron Picardi.

By the way, Ron's output is done using the Wiseman Apple Interface.

BALLY BLACK BOX   by Steve Walters

This is a computerized version of a game produced by Parker Brothers. An article in Creative Computing (Feb., 1980) discussed the game for a PET program.

How the game is played: The black box is an 8x8 grid. At the beginning of each game, the computer locates 5 balls (i.e., obstacles), one in each of 5 randomly selected squares. The balls are invisible to the player.

The object of the game is to determine the locations of the 5 balls least amount of information possible.

The player obtains information about the location of the balls by sending a probe into the box at one of the 32 edge squares, and observing its behavior: it may emerge at another edge square, be reflected back to the square the probe entered, or be absorbed. Based on these observations and the rules for how probes move, the player can deduce the location of the 5 balls.

The rules for how probes move:

1. PASS-THRU: A probe moves in a straight line unless it comes within one square (including one diagonal square) of a hidden ball.

2. ABSORBED: A probe which runs directly into a ball is absorbed.

3. DEFLECTED: When a probe encounters a ball in its left-front square (i.e., diagonally to the left in the direction of travel) it is deflected 90 degrees to the right. Similarly, when a probe encounters a ball in its right-front square, it is deflected 90 degrees to the left.

4. REFLECTED: A probe which encounters a ball in both its left-front and right-front corners is reflected back 180 degrees (i.e., it reverses direction).

5. DEFLECTED AT ENTRANCE: A probe which would be deflected before it enters the box (because a ball is diagonal to the probe entry location in the outer row) is reflected to its starting location.

6. ABSORPTION DOMINATES: note that when a probe encounters an absorption and a reflection or deflection situation side-by-side, the absorption always dominates.
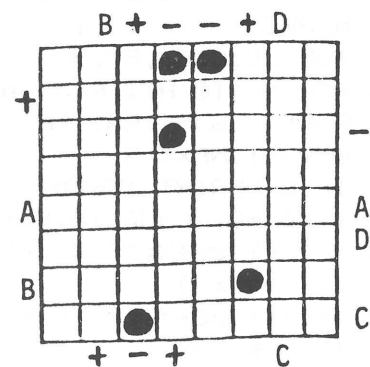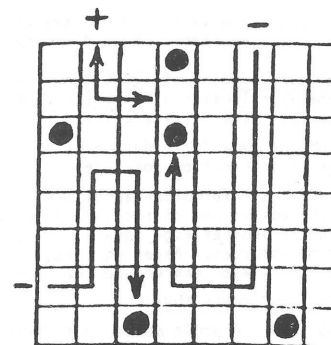
A=straight pass-thru
B,C,D=deflected right
         or left
+(left)=reflected
+(top & bottom)=
    deflected at entrance
-(bottom & right)=
    absorbed
-(top)=absorbed which
    dominates over re-
    flection in adjacent
    square

BALLY BLACK BOX

```
  1 Y=((R-1)cS)b8-K;X=(RM+1)b8-12
  2 CX=X;GOSUB 25;CY=YcKb2+Y;RETURN
  3 BOX V,W,C,C,3;IF (X#V)+(Y#W)MU=J
  4 RETURN
  5 FOR M=0TO ZbH;NEXT M;RETURN
  6 R=A;GOSUB 1;GOSUB 5;RETURN
  7 MU=J;L=L-1;GOTO 79
  8 BOX X,Y,C,C,3;V=X;W=Y;RETURN
  9 B=(Y+K)c8bS+(X+12)c8;RETURN
 10 D=-1bD;GOTO 15
 11 IF ABS(D)=1D=S;F=1;GOTO 15
 12 D=1;F=S;GOTO 15
 13 IF ABS(D)=1D=-S;F=1;GOTO 15
 14 D=-1;F=S
 15 B=E;GOTO 250
 16 FOR R=1TO H;IF @(R)GOSUB 1;C=7;GOSUB 8;MU=J;IF U>0IF PX(X,Y)=0Q=Q+5
 17 NEXT R;RETURN
 18 X=-4;Y=K;RETURN
 19 CY=0;CX=-75;RETURN
 20 R=B;GOSUB 1;GOSUB 5;IF A=B TV=43;GOTO 7
 21 TV=L;GOTO 79
 25 IF X=68CX=70
 26 RETURN
 30 IF @(B)GOSUB 6;TV=45;N=1
 31 RETURN
 40 CY=-32;INPUT " INPUT 1-4 PLYRS:"P
 41 IF (P<1)+(P>4)GOTO 40
 48 T=P;U=-1;FOR N=5TO 8;@(H+N)=0;NEXT N
 50 CLEAR ;PRINT " BALLY";PRINT " BLACK";PRINT " BOX",
 52 O=0;Q=0;L=64;I=0;T=T+1;IF T>P T=1;I=4;U=U+1
 54 FOR N=-32TO 32STEP 8;LINE 0,N,4;LINE 64,N,1;LINE N+32,-32,4;LINE N+32,32,1;
NEXT N;PRINT #1,"#",T
 56 BOX 32,0,67,67,3
 60 FOR N=1TO H+I;@(N)=0;MU=N;NEXT N;FOR N=1TO 5
 64 R=RND (8)bS+RND (8)+1;IF @(R)GOTO 64
 66 @(R)=1;NEXT N
 68 IF U=0PRINT ;PRINT " TEST";GOSUB 16
 79 &(20)=0;GOSUB 18;GOTO 97
 80 X=JX(T)b8+X;IF X<-4X=-4
 82 IF X>J X=J
 90 Y=JY(T)b8+Y;IF Y<-K Y=-K
 92 IF Y>K Y=K
 94 GOSUB 3
 97 C=3;IF ABS(Y)<KIF X<JIF X>-4C=5
 98 GOSUB 8;IF TR(T)GOTO 106
102 GOTO 80
106 IF C=5GOTO 500
107 IF ABS(Y)=KIF (X=-4)+(X=J)GOTO 80
110 Q=Q+1;L=L+1;IF L>90L=65
115 GOSUB 19;PRINT #1,"PROBES=",Q;&(20)=H;NT=H;MU=J;NT=2;GOSUB 9;A=B;GOSUB 2;TV
=L
130 D=S;F=1;IF Y=K D=-S
132 IF X=-4D=1;F=S
134 IF X=J D=-1;F=S
140 B=B+D;Z=18;N=0;GOSUB 30;IF NGOTO 7
```
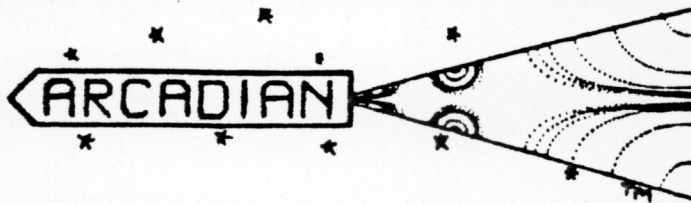

Multiple deflection
pass-thru

Deceptive reflection
and absorption

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```
150 IF @(B-F)+@(B+F)>0GOSUB 6;TV=43;GOTO 7
160 GOTO 210
200 E=B;B=B+D;G=BcS; IF (RM=0)+(RM=1)+(B>89)+(B<12)GOTO 20
210 N=0;GOSUB 30; IF NGOTO 7
220 IF @(B-F)IF @(B+F)GOTO S
230 IF @(B-F)GOTO 11
240 IF @(B+F)GOTO 13
250 Z=Z-2;IF Z<0Z=0
252 GOTO 200
500 MU=J; IF U=0T=4;GOTO 50
510 O=1-2bPX(X,Y)+O
515 BOX -46,-20,J,17,2;IF O=4GOSUB 19;CY=-16;PRINT "LAST";PRINT "GUESS
520 IF O<5GOTO 79
600 GOSUB 16;GOSUB 19;PRINT #1,"SCORE=",Q;@(H+T)=Q;@(H+T+4)=@(H+T+4)+Q
630 IF TR(T)GOTO 640
632 GOTO 630
640 CLEAR ;CY=32;IF T=PPRINT "END ",
642 PRINT #2,"ROUND",U;FOR N=1TO P;PRINT ;PRINT #1,"#",N," SCORE=",@(H+N),;IF T
=PPRINT #1," AVG=",@(H+N+4)cU,
648 PRINT ;NEXT N
650 IF TR(T)GOTO 50
652 GOTO 650
```

Now enter the following:

```
:PRINT; TV=0; TV=6; PRINT "&(9)=81;
&(0)=142; &(1)=142; &(2)=0; &(3)=0;
BC=155; FC=7; H=100; J=68; K=36;
S=10; :RETURN; NT=2; PRINT; PRINT;
GOTO 40"
```

ANALOG (NON-DIGITAL) CLOCK

After the clock face appears on the screen the computer will take a few seconds to figure out the coordinates for the minute dots and store them in array locations 0 thru 119. Then, in the upper left corner of the screen you will be asked to INPUT "H", hours, "M", minutes and "S", seconds. When you press GO you'll see the three clock hands, including a moving sweep second hand keeping accurate time. If clock speed needs adjusting change the value or R in line 230. A smaller number will speed up the clock, and a larger number will slow it down.

```
   1.ANALOG (NON-DIGITAL) CLOCK
   2.BY GEORGE MOSES
 10:RETURN;NT = 0;GOTO 80
 20 D = (C × 10) + (B ÷ 12 × 2);XY = 0;LINE
    @(D) ÷ 2,@(D + 1) ÷ 2,3
 30 E = B × 2;XY = 0;LINE @(E),@(E + 1),3
 40 FOR F = A × 2TO 119STEP 2;XY = 0;LINE
    @(F),@(F + 1),3;FOR T = 1TO R;NEXT
    T;XY = 0;LINE @(F),@(F + 1),3;NEXT
    F;A = 0;XY = 0;LINE @(E),@(E + 1),3
 50 B = B + 1;IF B = 60B = 0;C = C + 1
 60 IF C = 12C = 0
 70 XY = 0;LINE @(D) ÷ 2,@(D + 1) ÷ 2,3;GOTO 20
 80 CLEAR ;FC = 140;BC = 0;BOX
    0,0,160,88,1;BOX 0,0,100,84,3
 90 CX = − 2;CY = 36;PRINT "12
100 CY = 32;CX = − 27;PRINT "11",;CX = 25;PRINT
   "1
110 CY = 18;CX = − 41;PRINT "10",;CX = 38;PRINT
   "2
120 CX = − 40;CY = 0;PRINT "9",;CX = 41;PRINT
   "3
130 CY = − 16;CX = − 37;PRINT
   "8",;CX = 38;PRINT "4
140 CY = − 32;CX = − 24;PRINT
   "7",;CX = 25;PRINT "5
150 CY = − 36;CX = 1;PRINT "6
160 @(0) = 0; @(1) = 30; @(2) = 4; @(3) = 30; @(4)
   = 9; @(5) = 30; @(6) = 13; @(7) = 29; @(8) =
   17; @(9) = 28; @(10) = 21; @(11) = 27
170 @(12) = 24; @(13) = 25; @(14) = 27; @(15) =
   23; @(16) = 29; @(17) = 21; @(18) = 31; @(19)
   = 18; @(20) = 32; @(21) = 15
180 @(22) = 33; @(23) = 12; @(24) = 34; @(25) =
   9; @(26) = 35; @(27) = 6; @(28) = 35; @(29) =
   3; @(30) = 35; @(31) = 0
190 B = 28;FOR A = 32TO60STEP2; @(A) = @(B);
   @(A + 1) = − (@(B + 1));B = B − 2;NEXT A
200 B = 2;FORA = 62TO90STEP2; @(A) = − (@(B));
   @(A + 1) = − (@(B + 1));B = B + 2;NEXT A
210 B = 28;FOR A = 92TO
   118STEP2; @(A) = − (@(B));
   @(A + 1) = @(B + 1);B = B − 2;NEXT A
220 FORA = 0TO118STEP2;BOX
   @(A),@(A + 1),1,1,0;NEXT A
230 R = 378
240 CY = 40;INPUT"H"C;CY = 40;INPUT
   "M"B;CY = 40;INPUT"S"A;BOX
   − 65,40,30,8,1;GOTO20
```

```
   1 . DAREDEVIL
   2 . BY DAVE MARTIN
   5 V=7;U=8;L=0;W=35;J=11;T=100
  10 CLEAR ;NT=0;BC=0;FC=253;BOX 0,35,160,13,1;BOX 0,35,158,11,2;Y=5;FOR X=-68TO
70STEP 2;A=Xc20;A=ABS(RM);BOX X,Y,1,1,1
  20 BOX X,Y+1,1,3,A=0;BOX X,Y+2,1,5,A=10;NEXT X;CY=15;CX=-52;PRINT "40",;CX=W;P
RINT 280;BOX 0,-5,45,J,1;BOX 0,-5,43,9,2
  30 Y=-15;X=60;BOX X,Y,33,13,1;BOX X,Y,31,13,2;BOX X,Y,21,25,1;BOX X,Y,21,23,2;
CX=-30;CY=-15;PRINT "MILES TO GO
  35 CY=-35;CX=52;PRINT "TIME";GOSUB 660;BOX 0,22,43,J,3;BOX 0,22,41,J,3;A=RND (
10)+20;Y=A;M=0;T=0;P=1;N=5;GOTO 50
  40 P=RND (3);IF P=1P=5
  50 IF ABS(L)>17GOTO 430
  60 GOSUB 650;GOSUB 450;GOSUB Bb10+60;GOTO 200
  70 M=Mb3+RND (10)+20;RETURN
  80 M=Mb3c2+RND (6)+7;RETURN
  90 M=Mb7c8+RND (5)-6;RETURN
 100 M=Mb3c4-RND (9);RETURN
 110 M=Mb9c10+RND (Mc5+1);L=L+25b((B=5)b2-1);RETURN
 120 M=Mb13c14+RND (Mc5+1);L=L+15b((B=6)b2-1);RETURN
 130 GOTO 110
 140 GOTO 120
 200 IF M<0M=1
 210 IF A-Mc80>0GOTO 320
 220 T=T+Ab3600cM
 230 CY=W;CX=-59;BOX 0,W,160,J,2;PRINT "F I N I S H  L I N E";GOSUB 660;CX=-7;CY
=-5;PRINT "0.0
 240 CY=-24;PRINT "YOU PLACED #",#3,Tc(Yb2)-5;PRINT "AVG. SPEED = ",#1,Yb360c(Tc
9),"MPH
 270 IF JY(1)RUN
 280 GOTO 270
 320 IF M>280CY=-30;PRINT "LEAD F00T!!";GOTO 430
 390 T=T+30;A=A-Mc80
 395 IF M<20GOTO 50
 400 IF (P=1)+(P=2)+(P=4)+(P=6)GOTO 40
 410 P=P+1;GOTO 50
 430 GOSUB 650;IF M>280BOX 0,3,160,1,1
 440 CY=W;CX=-65;PRINT "SMASH - INTO THE WALL!";GOTO 270
 450 CX=-71;CY=W;BOX 0,W,158,11,2;GOSUB 450+Pb10;GOTO 515
 460 PRINT "       STARTING LINE";RETURN
 470 PRINT "      MID STRAIGHT-AWAY";RETURN
 480 PRINT " APPROACHING LEFT TURN";L=L+Mc(V+U);RETURN
 490 PRINT "        MID LEFT TURN";L=L+McV+7;RETURN
 500 PRINT " APPROACHING RIGHT TURN";L=L-Mc(V+U);RETURN
 510 PRINT "       MID RIGHT TURN";L=L-McV-7;RETURN
 515 IF N=0IF A=QGOTO 520
 516 IF A=Q N=N-1;GOTO 520
 517 N=RND (5)+4
 520 BOX 0,3,160,1,2;FOR X=-70TO Mc2-70STEP 2;BOX X,3,2,1,1;NEXT X;Q=A;CX=-7;CY=
-5;PRINT #1,A,".",N;GOSUB 660
 540 FOR B=1TO 8;CY=-30;BOX -47,CY,66,8,2;GOSUB Bb10+550;FOR Z=1TO 70;IF TR(1)CY
=-30;PRINT "<HERE GOES>";RETURN
 550 NEXT Z;NEXT B;GOTO 540
```

```
560 PRINT "FLOOR IT";RETURN
570 PRINT "ACCELERATE";RETURN
580 PRINT "BRAKE";RETURN
590 PRINT "BRAKE HARD";RETURN
600 PRINT "SHARP RIGHT";RETURN
610 PRINT "RIGHT";RETURN
620 PRINT "SHARP LEFT";RETURN
630 PRINT "LEFT";RETURN
650 BOX 0,22,39,J,1;BOX L,20,3,5,2;BOX L,25,1,4,2;BOX L-3,19,1,3,2;BOX L+3,19,1
,3,2;BOX L+2,25,1,2,2;BOX L-2,25,1,2,2;RETURN
660 CY=-15;CX=55;PRINT #1,T;RETURN
```

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Kettering, OH   45420

DAREDEVIL   You see a windshield and instruments. The car on the screen is located laterally according to your instructions. The available instructions will appear at the bottom in order, use TR(1) to choose.

107

```
  1 .
  2 .
  3 .THE PITS
  4 .BY REX GOULDING
  5 &(9)=167;&(11)=249;&(1)=249;FC=249;BC=119
 10 CLEAR
 17 PRINT
 18 PRINT "    THE PITS!"
 19 PRINT
 20 PRINT "ENTER NAME, THEN PRESS GO"
 30 N=0
 40 FOR A=1TO 10
 50 B=KP
 60 IF B=13GOTO 110
 70 TV=B
 80 N=N+1
 90 @(A)=B
100 NEXT A
110 CLEAR
115 PRINT
120 PRINT "THANK YOU ",
130 FOR A=1TO N
140 TV=@(A)
150 NEXT A
160 FOR A=1TO 152
165 NEXT A
170 CLEAR
200 X=-76;Y=26
210 C=0
220 FOR A=1TO 100
230 BOX 75-RND (145),41-RND (77),7,7,1
240 NEXT A
243 PRINT "BEGIN"
244 BOX X,Y,1,1,3
246 BOX 72,-42,3,3,3
247 CX=-77;CY=-40
250 IF JX(1)GOTO 270
255 IF JY(1)GOTO 270
260 GOTO 250
270 PRINT
275 BOX 72,-34,3,3,3
280 BOX 72,-42,3,3,3
290 Y=Y+8
295 BOX 76,0,1,80,1
300 FOR A=1TO 10
310 BOX 75-RND (145),-27-RND (8),7,7,1
320 BOX X,Y,1,1,3
330 X=X+JX(1)b2;Y=Y+JY(1)b2
340 BOX X,Y,1,1,3
350 IF PX(X,Y)=0GOTO 410
360 MU="1"
370 NEXT A
380 C=C+1
400 GOTO 270
410 IF X=72IF Y=-42GOTO 560
420 FOR A=1TO 10
430 &(23)=255;&(21)=255
440 BC=40
450 NEXT A
460 FOR A=1TO 30
470 BC=55
480 NEXT A
490 &(23)=0;&(21)=0
500 BC=119
510 PRINT "YOU BLEW IT ",
520 FOR A=1TO N
530 TV=@(A)
540 NEXT A
550 GOTO 620
560 PRINT "YOU WON ",
570 FOR A=1TO N
580 TV=@(A)
590 NEXT A
600 PRINT C," MOVES"
610 IF C<16PRINT "GOOD WORK !!!"
620 PRINT
630 PRINT "PLAY AGAIN? (PULL TRIGGER)"
640 FOR A=1TO 150
650 IF TR(1)GOTO 110
660 NEXT A
670 PRINT "NEW PLAYER? (PULL TRIGGER)"
680 FOR A=1TO 150
690 IF TR(1)CLEAR ;GOTO 17
700 NEXT A
710 PRINT "SO LONG FOR NOW
720 :RETURN
```

PITS   The object of the game is to move the small dot in the upper left corner past the pits to the center of the medium-size box in the lower right corner. The clunker is that the pits move up the screen all the time and can catch you. Each time the screen rolls up is counted as a move.   A successful   trip in 16 moves is doing well.
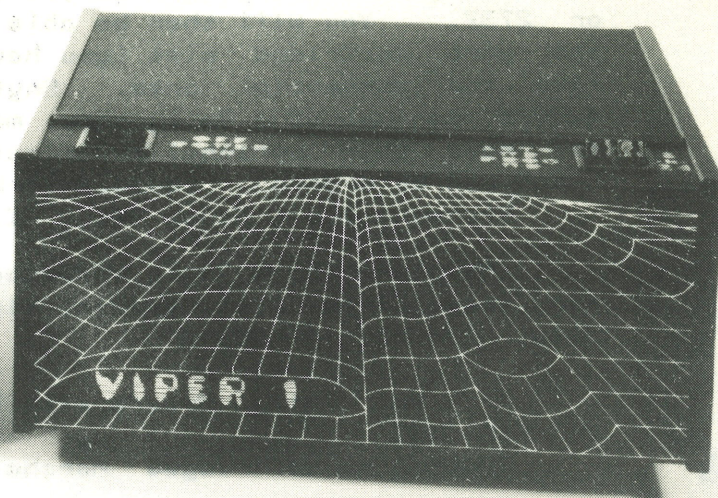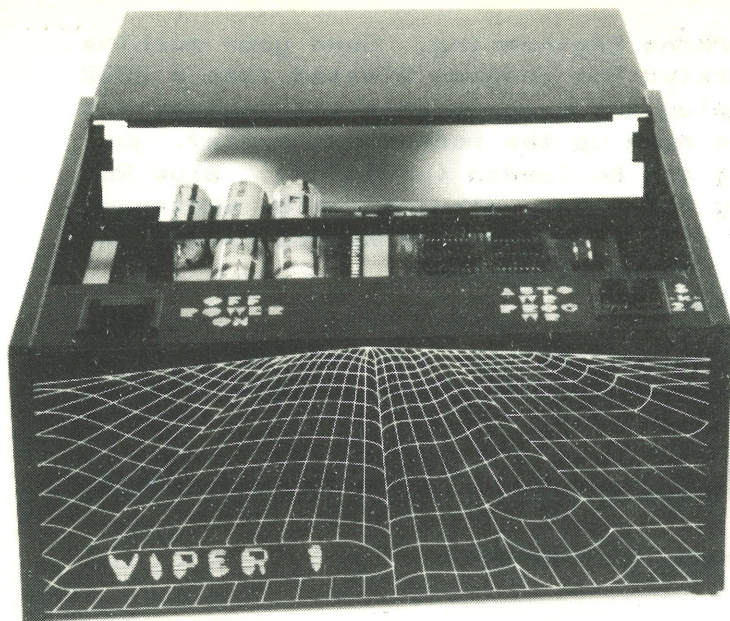
T. R. Goulding, MMC
CPO MESS
USS CALIFORNIA CGN-36
FPO New York, NY 09566

The VIPER SYSTEM 1 is the first of a series of custom manufactured, quality products made for the Bally Home Computer/Professional Arcade. With this system, you can begin the evolution of your Bally from the Professional Arcade to a powerful graphic computer. The VIPER SYSTEM 1 is a lot more than just a 16K memory expansion. Features and capabilities are listed as follows: one dual position front panel select switch for starting the memory at either 8 or 24K. This will make it convenient for the user to copy any game cartridges and run them in extended RAM where they can be modified or copied to tape. Next, one dual position front panel switch for Auto-Write-Protect or Programmable Write-Protect. The Automatic Write-Protect mode allows the user to load Jay Fenton's excellent new 8K Extended Basic from tape, and then use the Basic to write programs in the remaining 8K. The Programmable-Write-Protect allows you to Write-Protect or Write-Enable the entire 16K RAM board with simple Basic statements. Next, the RAM board located inside the cabinet has two eight position DIP switch packs. Switch pack one enables 4, 8, or 16K bank selectable addressing, and switch pack two controls special bus functions to the Bally and selects either external or internal clocking. SYSTEM 1 also includes a fuse-protected +/- 5 volt and +/- 12 volt power supply. These voltages provide power to the RAM and keyboard interface circuitry. Also included is a heavy duty grounded AC line cord, and filtered AC outlet on the back that is controlled by the front panel switch. The SYSTEM 1 Interface Board provides the bus conversion from the Bally to the VIPER bus, plus a serial keyboard interface which will allow the use of a VIPER or other serialized ASCII keyboard with the system. It also includes one bus cable connecting the VIPER to the Bally. The RAM board and keyboard can be unplugged from the SYSTEM 1 and later plugged directly into the SYSTEM 5 without any changes because the equipment is completely (software and hardware) compatible. For those of you who are home-brewers, when the SYSTEM 1 is upgraded to a SYSTEM 5, the SYSTEM 1 cabinet, power supply, and bus interface card can be used to help prototype your own computer circuits. The entire system is housed in an attractive heavy duty black aluminum cabinet with simulated wood grain side panels and custom silk-screening. The dimensions are 10"x10"x4-1/4"

Due to the response received when originally advertised in past issues of the ARCADIAN, there have been several changes and improvements made to the System RAM card and Interface Card. Therefore, please refer to this advertisement and following advertisements for accurate product information, pricing, and availability. SYSTEM 1 is available now for the special introductory price of $225, and a free Extended Basic (on tape and documentation) is included.

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Alternative Engineering, Inc. P. O. Box 128, Gardiner, ME 04345

EPROM BURNING now available via Perkins Engineering. Send your machine code program on tape and $20, and receive the program blasted into a 2532 or 2732. You will then be able to plug the program into the machine via the game cartridge slot (you have to make up the mechanical parts), just like the commercial ones. Anything can be loaded (up to 4K). Blue Ram owners can upload a Bally game, modify the rules, playing field, whatever, and have this personal modification made relatively permanent (since the EPROM can be erased). Contact Perkins Engineering, 1004 Pleasant Ave., Boyne City, MI. 49712

NEWLY released Bally Videocade game - Galaxian - now available. Send for free price list, special discount to ARCADIAN readers. SFP, 1064 N. Alta, Dinuba, CA 93618

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